

## LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

58. (Previously Presented) A method for removing one or more artifacts from a measured biological response profile, said measured biological response profile comprising measurements of a plurality of cellular constituents of a living cell or organism in response to a perturbation to said living cell or organism, each of said one or more artifacts comprising an artifact pattern comprising measurements of changes in said cellular constituents resulting from deviation of one or more experimental variables from desired values, said method comprising subtracting said one or more artifact patterns from the measured biological response profile, thereby removing said one or more artifacts from said measured biological response profile.

59. (Previously Presented) The method of claim 58, wherein each of the one or more artifact patterns comprises measurements of amplitudes of said changes in said cellular constituents associated with the artifact to which the artifact pattern corresponds.

60. (Previously Presented) The method of claim 58, wherein each of the one or more artifact patterns is determined by experiments with perturbations of said one or more experimental variables to which the artifact pattern corresponds.

61. (Previously Presented) The method of claim 58, wherein each of the one or more artifact patterns is determined by a cluster analysis of control biological response profiles, the control biological response profiles comprising measurements of a plurality of cellular constituents in experiments wherein said one or more experimental variables are perturbed to produce said artifact pattern.

62. (Previously Presented) The method of claim 58, wherein the one or more artifact patterns are scaled by scaling coefficients, each of the one or more artifact patterns having an independent scaling coefficient.

63. (Previously Presented) The method of claim 62, wherein the scaling coefficients are determined by a method comprising determining the values of said scaling coefficients such that the value of a function of the difference between the measured biological response profile and the sum of the one or more scaled artifact patterns is minimized.

64. (Previously Presented) The method of claim 63, wherein the function is minimized by a least squares minimization.

70. (Previously Presented) The method of claim 63 or 64, wherein the difference term associated with each cellular constituent in said function is weighted by a weighing factor, wherein said weighing factor is selected according to the significance of the measured value of said cellular constituent.

71. (Previously Presented) A method for removing one or more artifacts from a measured biological response profile, said measured biological response profile comprising measurements of a plurality of cellular constituents of a living cell or organism in response to a perturbation to said living cell or organism, each of said one or more artifacts comprising measurements of changes in said cellular constituents resulting from deviation of one or more experimental variables from desired values, said method comprising subtracting an artifact template from the measured biological response profile, wherein said artifact template comprises an artifact signature having greatest similarity to said biological response profile and is obtained by a method comprising comparing said measured biological response profile to a library of artifact signatures, each of said artifact signatures comprising measurements of amplitudes of said changes in said cellular constituents corresponding to different levels of said one or more experimental variables, said comparing comprising pattern matching of said measured biological response profile against said library; thereby removing said one or more artifacts from said measured biological response profile.

72. (Previously Presented) A method for removing one or more artifacts from a measured biological response profile, said measured biological response profile comprising measurements of a plurality of cellular constituents of a living cell or organism in response to a perturbation to said living cell or organism, each of said one or more artifacts comprising measurements of changes in said cellular constituents resulting from deviation of one or more experimental variables from desired values, said method comprising: (a) comparing said measured biological response profile to a library of artifact signatures to generate an artifact template, each of said artifact signatures comprising measurements of amplitudes of said changes in said cellular constituents corresponding to different levels of said one or more experimental variables, said artifact template comprising an artifact signature having greatest similarity to said biological response profile, said comparing comprising pattern matching of

said measured biological response profile against said library; and (b) subtracting said artifact template from said measured biological response profile, thereby removing said one or more artifacts from said measured biological response profile.

73. (Previously Presented) The method of claim 71 or 72, wherein said comparing comprises minimizing a function of the difference between said measured biological response profile and said library of artifact signatures.

74. (Previously Presented) The method of claim 73, wherein said function is minimized by a least squares minimization.

75. (Previously Presented) The method of claim 73, wherein the difference term associated with each cellular constituent in said function is weighted by a weighing factor, wherein said weighing factor is selected according to the significance of the measured value of said cellular constituent.

76. (Previously Presented) The method of claim 74, wherein the difference term associated with each cellular constituent in said function is weighted by a weighing factor, wherein said weighing factor is selected according to the significance of the measured value of said cellular constituent.